

Josh Miles

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Senior Design II

Spring Self-Assessment

Part A:

In our Senior Design project, we wanted to split the workload as evenly as possible for the different areas of development. For my individual contributions, I was responsible for collecting the raw dataset of training images that would become the basis of our ai model, developing the front-end user website, designing and implementing the system's database, and creating the API calls to connect everything together. This work aligned pretty well with my goals from my initial assessment in the fall, where I hoped to get some experience programming in a full-stack development context. I used/learned a lot of useful technologies like MySQL and web development with HTML and CSS, also JavaScript API calls. I went in with almost no industry experience in software development but, I was able to get it done with the help of my formal education at UC and self-learning.

My previous coursework only slightly helped, and as a result, I had to spend a lot of time learning these skills on my own. This was probably the biggest challenge I encountered – just having to start from scratch (in a way). After plenty of struggle, I learned how to connect the SQL database to the website with functional APIs, which was quite gratifying. Another big challenge was the synchronization between the database and the website. Debugging these timing issues helped understand a little bit more about asynchronous operations, state management, and RESTful API design. The major success was being able to watch it all work together smoothly in real-time with the video detection component.

Part B:

My group successfully delivered a fully functional prototype of G.E.M.S. We designed a system that detects gym equipment usage in real-time using a trained YOLOv5 model, updates a shared SQL database, and reflects availability data on a live website interface. To get to this point, Parker and I had to coordinate and communicate a lot to get to this point. It was neat being able to understand how working on a few components

translated to affecting the project as a whole in terms of a system-wide flow. Having a role in the development of this project taught me more about how collaboration works in the software development environment, since I didn't get this type of hands-on experience with my coops.

Our teamwork was very focused and collaborative. While we divided work responsibilities very early in the conception of the project, we still maintained regular meetings to communicate progress and help each other out with sections or issues. We worked pretty closely on the SQL database structure and data update logic. I believe my contributions to the project matched the effort and quality of my teammate. We played to each other's strengths and covered each other's weaknesses the best we could. In the end, the final product turned out great and even got us awarded the "Outstanding Senior Design Project Award" by the Department of Computer Science.